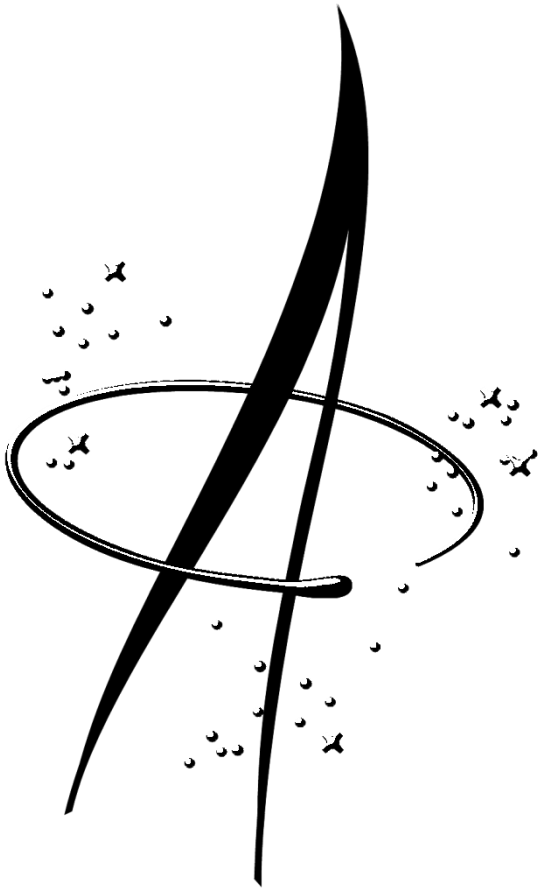
National Aeronautics and Space Administration

NASA ACADEMY AT MARSHALL SPACE FLIGHT CENTER



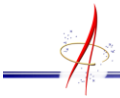
PROFILE BOOK 2014

"This is NASA's vision for the future. Our mandate is:

- To improve life here,
- To extend life to there,
- To find life beyond

So, how do we get to that impressive picture of the future? Part of the answer is by executing NASA's mission:

- ***To understand and protect our home planet***
- ***To explore the Universe and search for life***
- ***To inspire the next generation of explorers***
  … as only NASA can."



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Program Description

The NASA Academy is an intensive resident summer program of higher learning for college undergraduate and graduate students interested in pursuing professional and leadership careers in space-related fields.

The NASA Academy program is designed to present a comprehensive package of information and experiences about the organization of the NASA agency, some of its most important current and planned science, engineering, education, and technology enterprises, as well as a number of non-technical areas of critical significance, such as management, budgeting, safety, personnel and career development, leadership, space law, international cooperation, etc. Besides attending lectures and workshops, students are involved in supervised research in MSFC laboratories, and participate in visits to other NASA Centers and facilities and a number of space-related academic laboratories and industries.

Eligibility, Selection Criteria, and Placement

The participants in the Marshall NASA Academy have been selected based following criteria:

- academic rank (junior, senior, first, or second year graduate)
- academic performance (GPA higher than 3.2 or equivalent)
- demonstrated interest in the space program
- demonstrated leadership qualities
- research and/or project interest and experience
- maturity
- recommendation and references
- citizenship or permanent residence is required for US applicants

Both the selection process and placement of the Academy participants in Marshall's research groups were assisted by recommendations from faculty, administrators, academic supervisors, and co-workers, and the applicants' self-profiling essays.

A Brief History of the NASA Academy

The NASA Academy was founded in 1993 (as the "NASA Space Academy") at the Goddard Space Flight Center by Gerald (Jerry) Soffen, former Mars Viking project scientist, architect of the NASA Astrobiology program, and first Director of the Goddard Office of University Programs. Jerry was an accomplished scientist and a dedicated educator. He took advantage of the unusual opportunities presented to him during his career and realized the importance of mentoring in the life of young professionals. In his vision, the Academy was intended to exceed in purpose and content all the other regular internships by familiarizing its participants with as many facets of the NASA agency as possible. With his dynamic personality and unique leadership, he opened many gateways and defined a new standard of excellence.

As the reputation of the Goddard Academy widened, new NASA Academy Programs were started at the Marshall Space Flight Center (1994), the Ames Research Center (1997), and the Dryden Flight Research Center (1997). In 2005 Goddard, Glenn, and Marshall will host their own Academy.

The name of the program changed from "NASA Space Academy" to "NASA Academy" at specific NASA Centers. A continuous effort is being made to establish or re-establish Academies at various NASA Centers, with different profiles and focus areas.

Jerry Soffen died on November 22, 2000. We honor his legacy by continuing the Academy program that he loved so well.

In 2012, the NASA Academy celebrated twenty years of successful activity. So far, more than 700 students have graduated from the program, both domestic and international students.

Southwestern Oklahoma State University
Weatherford, Oklahoma
Engineering Technology with a specialization in
Computer and Manufacturing Engineering Technology
Bachelors of Science, May 2017
E-mail: adneya@student.swosu.edu

NASA Academy Research Project:

"Development of a Brass Board Controller for a New Avionics System"
Principal Investigator: Kenneth House

Research and Experience

- **Field Technical Advisor**, NASA First Tech Challenge Oklahoma Robotics Competitions (September 2012 – Current)
- **Judge,** NASA First Tech Challenge Alamo Super Regional Competition (February 27 – February 28, 2014)
- **Writing Center Tutor,** Southwestern Oklahoma State University (January 2014 - Current)
- **Camp Counselor,** Tech Trek at Southwestern Oklahoma State University (July 2013)
- **Health Care Coordinator/ Daily Living Support,** Jones Health Care in Weatherford, OK (September 2012 - Current)
- **Swim Instructor,** Summer Playground in Clinton, OK (Summer 2011, 2012, and 2013)
- **Page,** Oklahoma State Capital for Oklahoma Majority Floor Leader, Senator Mike Schulz (May 2012)

Honors and Activities

- Chesapeake Energy Corporation Scholarship recipient (May 2014)
- Oklahoma NASA Space Grant Geospatial Summer Fellowship (2013)
- Adobe "Make Your Mark" $1000 scholarship (2013)
- Southwestern Oklahoma State University Scholar Award (2012-2013)
- Southwestern Oklahoma State University NASA Human Exploration Rover Challenge (formerly the Great Moonbuggy Race) 2012-2013 and 2013-2014
- Southwestern Oklahoma State University Society of Women Engineers (Officer 2012-2013, Member 2012-Current)
- Zinch Sweet Diggity Dawg Computer and Technology Super Student (2012)
- Southwestern Oklahoma State University President's Honor Roll (Fall 2013)
- Southwestern Oklahoma State University Dean's Honor Roll (Fall 2012, Spring 2013, & Spring 2014)

Skills

- Computer Skills: AutoCAD, Solidworks, LabView Robotics Programming, Microsoft Office Suite
- Basic Knowledge of: ArcGIS Map, Visual Basic Programming, Java, Dreamweaver, Microsoft Excel Economic Decision Analysis Tools
- Communication Skills: Written, Verbal, and Listening
- Writing

Personal Statement

Technology has always fascinated me. At a young age, I began to keep track of the latest news regarding all of the interesting new ideas, discoveries, and technologies that NASA was producing. Like many other children, at one point, I wanted to be an astronaut; I wanted to be the first person on Mars. When I found out that I lived fifteen minutes away from where General Thomas P. Stafford used to live, I began to believe that my dreams may not have been as impossible as they seemed. General Stafford became an inspiration in my life. Never again would I let anyone put a limit on what I could accomplish. If General Stafford from Weatherford, Oklahoma could fly in space, then maybe one day, I could too.

As I grew older, my passion and interest for technology became much stronger. Unfortunately, I knew nothing of careers in Engineering or Technology until I joined my school's NASA sponsored First Tech Challenge (FTC) robotics. Soon after joining the team, I developed a love for robotics. My second year on the robotics team, I was the Lead Programmer and a Co-captain. I helped lead my team to the Oklahoma State FTC Competitions. Being a part of the team allowed me to make connections with the Engineering and Computer Science Departments at Southwestern Oklahoma State University (SWOSU). After talking to some of the SWOSU professors, I knew I wanted to pursue a degree in engineering.

Now, I am a college junior at SWOSU pursuing a degree in Engineering Technology with two specializations: Computer Engineering Technology and Manufacturing Engineering Technology. I was inspired to specialize in both areas because of my involvement in the NASA Human Exploration Rover Challenge (formerly the NASA Great Moonbuggy Race). Being a part of SWOSUs Moonbuggy Team helped me see multiple areas of engineering come together. I love learning and understanding the operations happening around me. I chose to specialize in both areas because I want to have a broader knowledge and understanding of the software and hardware, as one might say, of engineering. One day, I hope to make a real contribution to the world, and specializing in both areas will assist me in doing so.

After finishing my Bachelor of Science, I plan on furthering my education and obtaining a Master's degree. Currently, I have not chosen a career path to pursue after I finish my education. However, I hope that through my upcoming experiences and internships, I will be able to find the career path that is right for me. Companies I have considered working for in the future include U.S. Navy, NASA, SpaceX, Boeing, Google, Esri and Raytheon.

University of Alabama Huntsville
Huntsville, Alabama
Master of Business Administration, May 2015
Biology with minor in Chemistry
Bachelors of Science, December 2012
E-mail: daugherty.rachel@gmail.com

NASA Academy Research Project:

"Development and Activation of Space Act Agreements"
Principal Investigator: Scott Jackson

Research and Experience

- **Marketing and Human Relations Intern**, Conversant Biologics, Inc., Huntsville, AL (Oct. 2013 – Jan. 2014)
  - Researched, wrote, and designed marketing collateral for company website and sales team
  - Collaborated with marketing and human resource personnel to review technical marketing documents and develop potential marketing strategies
- **Huntsville Rural Premedical Internship**, University of Alabama School of Medicine, Huntsville, AL (May 2012 – July 2012)
  - Shadowed physicians, healthcare administrators, and other allied healthcare professionals
  - Developed client communication skills and business acumen by assisting with primary patient care, medical information system restructuring, occupational and physical therapy coordination, and healthcare management
- **Undergraduate Teaching Assistant and Lab Manager**, University of Alabama Huntsville, Huntsville, AL
  (Jan. 2010 – May 2010, Aug. 2011 – May 2012)
  - Independently instructed Cell Biology laboratory classes
  - Developed, implemented, and maintained an Excel based chemical and supply inventory system
  - Took initiative to redesign experimental setups and procedures
  - Researched, wrote, and designed supplemental reference documents and published a detailed instructor's manual
- **Laboratory Research Assistant**, University of Alabama Huntsville, Huntsville, AL (Aug. 2010 – Aug. 2011)
  - Improved operations management of greenhouse and plant tissue culture facilities
  - Employed molecular biology techniques and computer aided analysis to metabolically engineer a biofuel source from *Jatropha curcas*

Honors and Activities

- Dean's List School of Graduate Studies University of Alabama Huntsville: 2014
- Member Beta Gamma Sigma Business Honor Society: 2014
- Awarded honor of Highest Academic Achievement in the University of Alabama Huntsville College of Science: 2012
- Member of Alpha Epsilon Delta Premedical Honor Society: 2012– 2013
- Association of Southeastern Biologists Annual Conference presenter and volunteer: 2011
- University of Alabama in Huntsville and the Partnership for Biotechnology Research Bioretreat presenter: 2010
- Member American Medical Student Association: 2007
- Member Society of Women Engineers: 2005
- Hospital volunteer: 2005-2008
- Operation Stand Down Huntsville volunteer: 2012
- Girls' Science and Engineering Day volunteer: 2005, 2011

Skills

- Computer Skills: Proficient with Microsoft Office (Word, Excel, and PowerPoint) and audiovisual equipment
- Laboratory Skills: PCR, gel electrophoresis, microscopy, spectrophotometry, plant DNA extraction, plasmid transformation and isolation, and DNA sequencing and analysis

Personal Statement

When I was told as a child to "reach for the stars," I did so quite literally. As the child of a NASA engineer, I developed a deep interest and respect for science, mathematics, and aeronautics at an early age. In college, I further explored these interests by pursuing a degree in biology with a chemistry minor. After graduating *summa cum laude* from the University of Alabama in Huntsville in 2012, I decided to leverage my fascination with science to improve business operations in the science and engineering industries. From my undergraduate research in biofuel development and laboratory teaching experiences, I recognized that my abilities to facilitate complex procedures and analyze multifaceted data were ideally suited for the business world. I realized that could understand the intricate details of scientific research and translate those needs to identify and pursue the business support needed for their success. Consequently, I am currently pursuing an MBA at UAH with an emphasis in science and technology administration. I am excited to participate in the NASA Academy internship to gain valuable work experience in combining scientific knowledge with business administration. NASA's mission is very similar to mine in that I desire to explore the unknown and tackle challenges in unique ways.

University of Maryland, College Park
College Park, Maryland
Aerospace Engineering
Doctorate of Philosophy, May 2019
E-mail: Anthony.joseph.decicco@gmail.com

NASA Academy Research Project:

"Manufacturing Techniques for Composite Overwrapped Pressure Vessels"
Principal Investigator: Chad Hastings

Research and Experience

- **Effect of process parameters on material properties of FDM thermoplastics**, August-October 2013, MIT-LL
  - Designed test articles to mimic orthotropic laminar composites for tensile and thermal expansion testing
  - Evaluated current theory on FDM-produced parts and proposed raster packing models
  - Validated symmetric orthotropic composite model in ANSYS with experimental results
- **Complex Plasmas and Granular Flows: A Review on ISS Capabilities and Experiments Past, Present, and Future**, June-July 2013, Worcester Polytechnic Institute (Funded through the MA Space Grant)
  - Completed a comprehensive report on Complex Plasma and Granular Flow research in space-based applications from Academia, NASA, ESA, and joint German-ROSCOMOS experiments
  - Evaluated the ISS capabilities for Past, Present, and Future microgravity research
- **Managing Climate Change: Sjællandsgade as a Green Corridor**, March-May 2013, Copenhagen, Denmark
  - Developed a Matlab program to calculate the expected rainfall and flow pattern in a moderately dense neighborhood during major and minor rainfall events
  - Created sustainable floodwater mitigation solutions for climate change adaptation in the Sjællandsgade corridor for a variable political and economic environment
  - Composed a manual to enable NGOs in Copenhagen to enact our Methodology

Honors and Activities

- Dean's List
- Alpha Chi Rho National Fraternity
- Order of Omega National Honor Greek Society
- WPI Stage Band and Jazz Ensemble
- American Society of Mechanical Engineers
- American Institute of Aeronautics and Astronautics

Skills

- Matlab
- Insight and Control Center
- SolidWorks
- LabView Signal Express
- MathCAD
- Microsoft Office Suite
- Additive Manufacturing
- Milling and Lathe

Hobbies and Interests

- Hiking, Skiing, Travelling
- Amateur Astronomy, Tinkering
- In-Space Propulsion, Space Weather, Dust Lofting on low-g bodies

Personal Statement

Anthony DeCicco is a graduate of Worcester Polytechnic Institute (WPI) with his Bachelor's and Master's degrees in Mechanical Engineering. At WPI, he pursued an accelerated program to complete both of these degrees within a four-year plan. His research at WPI consisted of a broad range of topics from dusty plasmas to improving the mechanical properties of parts produced through additive manufacturing. Anthony will be continuing his studies at the University of Maryland College Park under Dr. Christine Hartzell developing a code to predict dust lofting on low gravity bodies due to a variety of phenomena for his PhD. Anthony one day hopes to develop simulations for stable fusion-state plasmas and simulations for future EM shielding technologies.

In his free time, Anthony plays jazz saxophone in a variety of ensembles and enjoys singing in his school's glee club. He also has taken up astronomy in the past year and has been rewarded with stunning views of Saturn, Jupiter, and Mars. Anthony is excited about his first opportunity at NASA to help develop the capabilities needed to explore our solar system and universe. He looks forward to a challenging but highly rewarding summer at MSFC to conduct research at the world's leader in spaceflight.

Michigan State University
East Lansing, Michigan
Physics
Bachelors of Science, May 2015
E-mail: goodwi63@msu.edu

NASA Academy Research Project:

"Charging of Objects in the Space Environment"
Principal Investigator: Paul Craven

Research and Experience

- **Research Assistant,** Michigan State University (August 2011-Present)
  - Study Cytochrome Complex's electrical properties using Atomic Force and Scanning Tunneling Microscopy
  - Responsible for the preparation of both organic and inorganic samples used in various studies
  - Study Bismuth Selenide mounted on a superconductor at room temperature to observe proximity effects in the topological insulator
  - Construct support structure for thermal evaporator used in sample preparation
- **Intern,** NASA Glenn Research Center, Cleveland, Ohio (Summer 2013)
  - Modeled geometries and ran tests/simulations on various air filters and ventilation configurations
  - Built, programmed, and installed video capture system for an experiment flying in zero-gravity (Two-Phase Flow Separator Experiment)
  - Updated electrical schematics and assisted in mechanical refitting of flight rig for TPFSE

Honors and Activities

- Member of Society of Physics Students (SPS) August 2011-Present
- Member of Honors College August 2011-Present
- Six time Dean's List member

Skills

- Scanning Tunneling Microscope (STM), Scanning Electron Microscope (SEM), Atomic Force Microscope (AFM & CP-AFM)
- Thermal Evaporator, Clean Room Trained (1000), Mill, Lathe, Welding, Soldering
- Excel, IGOR Pro, Matlab, COMSOL MultiPhysics, CAD

Presentations

- "Fabrication of Scanning Tunneling Microscopy Tips", University Undergraduate Research and Arts Forum, MSU, April 2013
- "Two Phase Flow Separation & Particulate Filtration", Ohio Aerospace Institute, NASA Glenn (LERCIP), August 2013
- "Mathematical Principles Behind Scanning Tunneling Microscopy", Lyman Briggs Research Symposium, MSU, April 2014 (*Best in Class)

Personal Statement

Throughout my childhood, my parents instilled in me the value of hard work. Whether it was emptying trash at the dentist's office at ten, vacuuming banks at thirteen, driving my father to work at fifteen and working a full day, or the numerous night shifts at McDonalds in high school, I've always held a job in some capacity. The experience I've gained from working has helped shape me into the person I am today.

This work ethic has been the driving force behind my journey through an undergraduate degree in Physics at Michigan State University. Together with my passion for physics, I have since been blessed to have the opportunity to work in labs at Michigan State University, NASA Glenn, and NASA Marshall, where my interest in and knowledge of all things space and aeronautics have grown in leaps and bounds.

As I move forward with my academics and career, I hope to continue contributing to the furthering of human knowledge. Making new discoveries and inventing new techniques takes ingenuity, but all the curiosity in the world is for naught without an investment of time and energy. My goal as a scientist is to be able to bring both the passion for the subject, and the will to see the project come to fruition even through adversity. If I succeed in those objectives, everything else will follow.

University of Hawaii
Honolulu, Hawaii
Biological Engineering
Masters of Science, May 2015
E-mail: davidharris19@gmail.com

NASA Academy Research Project:
"Life Support Adsorption Technologies"
Principal Investigator: Jim Knox

Research and Experience

- **Graduate Research Assistant,** Hawaii Natural Energy Institute, Honolulu, HI (2013-Present)
  - Conducted intensive literature review, writing proposals for research funding, creating a computational model of fluid movement in porous media, operated automated CNC mill for rapid prototyping
- **Undergraduate Research Assistant,** Utah State University Synthetic Biomanufacturing Center, Logan, Utah (Summer 2011, May 2012- June 2012)
  - Prepared cell cultures, cloning E. coli for the prediction of bioplastics, PCR and NMR
- **Lab aid/Teachers Aid,** Snow College Biology Department, Ephraim, UT, September 2007-May 2009
  - Prepared media for cell growth, practiced sterilizing techniques
- **Senior Project,** Utah State University, Logan , Utah
  - Reinforcing layers of PDMS with Spider Silk Films and Carbon Nanotubes
  - Infusing PDMS with CNTs.
  - Able to adhere spider silk films on to PDMS and make multiple layers.
  - The ultimate goal is to have multiple layers of this material for use in injury prevention and bullet proofing.

Presentations/Publications

- Computational 3-D Modeling of Water Transport in Eucalyptus Wood
  - Prospectus - (Pending-2013)
- Creating Flexible Bullet Proof Material using Carbon Nanotube Reinforced Polymers and Spider Silk Films
  - Presentation to the USU Industrial Review Board- April 2012
- Creating Flexible Bullet Proof Material using Carbon Nanotube Reinforced Polymers and Spider Silk Films-
  - Spring Poster for Undergraduate Research Symposium - March 2012

Honors and Activities

- Eagle Scout, March 2001, Salt Lake City
- Institute of Biological Engineering - August 2011-August-2012
- Secretary of USU Chapter - August 2011-August 2012

Skills

- A+ certificate, (License to troubleshoot and fix computers)
- Lab Safety Training- November 2013
- Shop Safety Training- August 2012
- Hazardous Waste Training- August 2012

Hobbies and Interests

My interests include, history, particularly military history and sports especially Lacrosse, Judo and Football. .

Personal Statement

I spent most of my youth in Salt Lake City, but now reside in Honolulu Hawaii where I am attending graduate school. Since I was young, I had strong interest in science particularly the life sciences. In addition to this I was always interested in invention and being a pioneer in cutting edge fields. My dual interest led me to discover the field of Biological Engineering. This career path met both of my needs, I can use principles discovered in biology to invent new technologies.

I received my Bachelor's Degree in Biological Engineering from Utah State University and I am currently pursuing a Master's degree in the same field from the University of Hawaii, Manoa. I hope my knowledge in this field will better improve the space industry.

Western Washington University
Bellingham, Washington
Applied Mathematics
Bachelors of Science, Fall 2014
E-mail: austin.tyler.hill@gmail.com

NASA Academy Research Project:

"Statistical Mechanics of the Fermi Acceleration Process"
Principal Investigator: Nasser Barghouty

Research and Experience

- **Administrative Assistant,** Change Architect, Inc., Fredericksburg, Virginia (April 2011 to Current)
  - Administrative Assistant to the Senior Prime Consultant/Project Manager
  - Prepared and organized meeting materials
  - Facilitated management of information technology equipment
- **University Residences Custodial Staff,** Western Washington University, Bellingham, Washington (June 2012 to September 2012)
  - Facilitated relationships between university residences and guests
  - Prepared university spaces for summer conferences through custodial preparation and maintenance
- **Summer Youth Intern,** Central Baptist Church, Buna, TX (June 2012 to September 2012)
  - Facilitated events that occurred in and around the church while acting as a youth mentor
  - Led students on staffing trips to Lee University in Cleveland, TN
  - Participated in and organized volunteer service at the Mission Centers of Houston

Honors and Activities

- Small Group Leader, Campus Christian Fellowship, 2012-2014
- Ultimate Frisbee, Intramural Team Captain, 2011-2014
- Treasurer, Mathes Hall Student Council, 2011-2012

Skills

- Expertise utilizing mathematical concepts in the creation of algorithms and to provide optimization through numerical computation and analysis
- Substantial experience programming in C++ and Matlab; additional experience using C# and ADA
- Proficiency using Windows, Linux operating systems, Microsoft Visual Studio, Mathematica, Matlab, Minitab, Lindo, LaTeX, Texas Instruments, and Microsoft Office

Personal Statement

As a child, I had a perpetual aspiration to become an astronaut and to work for NASA. On the eve of finishing my undergraduate college career, at least half of that aspiration is coming true in my invitation to participate with the NASA Academy this summer. This coming Fall, I will be completing my final quarter in achieving my B.S. in Applied Mathematics from Western Washington University. I am a goal-driven individual, and my lifestyle avidly involves solving real-world problems presented to me with innovative solutions. I love employing analytics, analysis, logic, and mathematics in order to create unique solutions.

The reason that I enjoy math is in the application and the multidisciplinary nature of it. As a mathematician, I can step into any other realm -- social science, engineering and technology, research -- and make a contribution. I believe it takes a special kind of mind to work as a mathematician; one in which you can pay great attention to detail while retaining the capacity to take a step back and see the greater picture. As I have contended with the rigors of the university, I believe my education has been formative and instilled such a mind in me. I look forward to being able to use the skills that I have acquired through my education during my time at the Academy, all the while continuing in my on-the-job education.

University of Washington
Seattle, Washington
Aeronautics and Astronautics
Doctor of Philosophy, June 2017
E-mail: osaig@uw.edu

NASA Academy Research Project:

"Testing Materials for Exploration Life Support"
Principal Investigator: Hernando Gauto

Research and Experience

- **Lieutenant Commander,** United States Navy (2005-2012)
  - Naval Aviator, Lockheed Martin C-130 International/Overwater Aircraft Commander
- Research Assistant, University of Washington (2009-Present)
  - Advisors: Professors Stephen Wood and Adam Bruckner
  - Spectral analysis of water for soil characterization of Mars subsurface

Honors and Activities

- NROTC Scholarship 1999-2003
- National Defense Service Medal, Armed Forces Expeditionary Medal, Global War on Terrorism (Expeditionary) Medal, Global War on Terrorism (Service) Medal, Navy and Marine Corp Achievement Medal
- Graduate Opportunities and Minority Achievement Program Fellowship, 2009
- Integrative Graduate Education and Research Traineeship Program (IGERT) via University of Washington's Graduate Certificate Program in Astrobiology 2010-2011
- National Science Foundation Graduate Research Fellowship (NSF-GRFP) 2011-present
- Space Resources Roundtable and Planetary Mining Sciences Symposium (SRR-PTMSS) Student Scholarship, 2012
- California Institute of Technology (Caltech) Space Challenge First Place Award (team), 2013
- Women in Aviation International, 2006-Present
- American Institute of Aeronautics and Astronautics (AIAA), 2012-Present
- AIAA Technical Committees, Space Resources Technical Committee, Space Colonization Technical Committee, 2013-Present
- Women in Science and Engineering (WISE), 2014-Present

Skills

- Naval Aviator (Commercial Pilot Qualified)
- LabVIEW, ENVI and IMPACT (image processing), Spectral analysis experience (FTIR/ATR), MATLAB, Mathematica, Simulink
- Foreign language: Japanese: speak/read/write (proficient)

Presentations/Publications

- Women in Science and Engineering Conference (2012-2013) Panel Speaker, Moderator
- Astrobiology Science Conference (2010-2014) Poster Presentation: "Adsorbed Water: A Potential Habitat for Microbial Life on Mars"
- SRR-PTMSS (2012) Oral Presentation: "Interfacial Water as an ISRU Objective: A Proposed Investigation with Internal Reflectance Spectroscopy"
- AIAA Aerospace Sciences Meeting (2013) Oral Presentation: "Interfacial Water as a Mars ISRU Objective: Detection of Microscopic Water Using Fiber Optic Sensors"
- Igbinosun, O. "Spectroscopic Analysis of Various Phases of Water with an Intrinsic Near-Infrared Optical Sensor System," MS Thesis, Department of Earth & Space Sciences, University of Washington, Seattle, WA, 2013.
- Igbinosun, O. J., et al. "Interfacial Water as a Mars ISRU Objective: Detection of Microscopic Water Using Fiber Optic Sensors," Paper AIAA 2013-0437, 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, January 7-10, 2013.

Personal Statement

I credit much of my passion for space exploration to science fiction. When I was younger, I enjoyed reading about travels through space and time, and reflecting on the vastness and complexity of our universe. As I grew older, I realized that some of these themes are very much a part of our reality. This inspired me to pursue science in high school and eventually led me to aerospace engineering.

After graduating from the University of Rochester with a Bachelor of Science degree in Physics and Astronomy, I commissioned as an officer in the United States Navy. I completed flight training, became a Naval Aviator and flew C-130s in the Navy Reserve for six years. Upon returning to academia, I began experimental work in spectral analysis; specifically, spectral detection of water for ISRU (in-situ resource utilization) applications. After completing a Master of Science degree in planetary science, I transitioned to engineering. My goal is to combine my background in astronomy, planetary science and engineering to identify practical methods of recovering and processing usable water (and other consumables) from the subsurface of terrestrial bodies, specifically Mars, in support of human exploration missions.

The Marshall Space Flight Center Space Academy is an exceptional opportunity to become exposed to the many facets of NASA. I look forward to learning and contributing to this experience.

St. Edwards University
Austin, Texas
Chemistry
Bachelors of Science, Spring 2015
E-mail: aking8@stedwards.edu

NASA Academy Research Project:

"Sorbent Screening Characterization"
Principal Investigator: David Watson

Research and Experience

- **Chariman Elect,** Dean's Leadership Council, St. Edward's University (Fall 2013 - Present)
  - Collaborate with School of Natural Sciences Dean to provide an enriching experience for science majors. Plan social events, guest speakers, and interviews prospective faculty.
- **Undergraduate Researcher,** Austin, Texas (Fall 2013 - Present)
  - *Fluorescence Based Detection of Heavy Metal Ions in Aqueous Solutions Utilizing Gold Nanoparticles*.
- **President, American Chemical Society,** St. Edwards, Austin, Texas (Spring 2013 - Present)
  - Lead student chapter of American Chemical Society. Hold monthly meetings to encourage scientific discourse in the St. Edward's Community. Arrange for guest speakers, social events, and annual visits to the ACS National Meetings.
- **Teaching Assistant,** Organic Chemistry I, II, & General Chemistry Labs, St. Edward's, Austin, Texas (Fall 2013 - Present)
  - Design and organize experiments for undergraduate labs.
  - Act as an intermediate for students and help guide students through procedures.
  - Manufacture reagents and prepare laboratories for experimentation.
- **Intern,** Synergy Oil and Gas, LP, Houston, Texas (Summer 2011)
  - Designed and plotted oil recovery maps to aid in secondary oil recovery project.
- **Intern,** ERGOS Technology, Houston, Texas (Summer 2010)
  - Performed various service calls to businesses and corporations to manage computer infrastructure.

Skills

- Spectra acquisition and analysis
- Experienced in analytical reporting
- Strong interpersonal communication skills
- Very experienced with the Microsoft Office Suite
- Proficient in Windows, Mac OS, and Linux
- UV/Vis/NIR, FTIR, GC-MS, Fluorescence, NMR, HPLC, and Atomic Absorption spectrometers. Have hardware troubleshooting experience with UV/Vis, HPLC, and NMR spectrometers.

Hobbies and Interests

When I'm free from school, I enjoy rock climbing, yoga, exercising, and exploring the outdoors. I also love tinkering with anything technological; if I can take it apart, I will. I also volunteer with the American Chemical Society. I help organize and run events at local childrens' museums and science centers.

Personal Statement

I am a senior Chemistry student with a Math minor at St. Edward's University in Austin, Texas. I have been tinkering with everything since I was little and Chemistry's description of the building blocks of everything really appealed to me. When young, I also developed a love for space when visiting my local science museum in Houston. Making my way through school, I had dreams of working in many different professions but the space industry and more specifically, the dream of becoming an astronaut, has always stuck with me. Even though the chances of becoming an astronaut are quite slim, that slim chance motivates me to keep learning as much as I can from as many people as possible. Growing up, I knew I wanted to study science and actually started college as an Electrical/Computer Engineer but loved the hands-on labs of Chemistry. After a year as an engineer, I switched to Chemistry and I have really enjoyed my time as a chemist. When I'm not researching in the lab or fiddling with the instruments, I enjoy the outdoors of Austin. I practice yoga regularly and like to exercise and rock climb as well. I also enjoy keeping up with the tech world and dabble in the stock market.

University of Minnesota – Twin Cities
Minneapolis, Minnesota
Honors Physics & Astrophysics Double Major
Bachelors of Science, Spring 2015
E-mail: mcsav001@umn.edu

NASA Academy Research Project:

"HEROES Balloon Flight Alignment Monitoring Systems: Post Flight Analysis"
Principal Investigator: Dr. Jessica Gaskin

Research and Experience

- **Research Assistant,** NASA Armstrong Flight Research Center, Palmdale, California (Summer 2013)
  - Airborne Observatory for verification, validation, and commissioning of SOFIA telescope/aircraft.
  - Results of study impact future upgrades and budget cycles.
- **Research Assistant**, NASA Jet Propulsion Laboratory, Pasadena, California (Summer 2008)
  - Observation and image analysis of recently discovered asteroids, comets, TNOs and the determination of orbits.
  - Processing telescopic data from major ground observatories, including Palomar's 200-inch telescope & Sloan Digital Sky Survey.
  - Part of JPL's Solar System Dynamics group.
- **Tech Aide,** 3M Corporate Research Labs, St. Paul, Minnesota (May 2012-Present)
  - Designing computer simulations of nano-structured meta-materials for new proprietary technologies.
  - Developing glasses-free 3D display technology; computer modeling of images and animations for 3D displays, testing and analysis of prototypes.

Skills

- C++
- Python
- LabView
- Mathematica
- IDL
- IRAF
- POV-ray
- Scheme
- Photoshop
- MS Office Suite
- Mac/Windows/UNIX OS
- Electrical engineering
- Wiring & soldering
- Prototype assembly skills.

Personal Statement

Matthew McSavaney studies Honors Physics and Astrophysics at the University of Minnesota – Twin Cities, and is a Research Aide at 3M Corporate Labs in St. Paul, Minnesota. Matthew is motivated by questions in Astrophysics, Cosmology, Humanities, and the Public Understanding of Science. His past internships with NASA, school career, and life experiences have led him to the NASA Academy at Marshall Space Flight Center. A self-styled renaissance man, Matthew has associate's degrees in both Behavioral Sciences, and Physical & Biological Sciences. He has experience as a dramatic actor, musician, and certified tennis pro; and builds radios and telescopes in his spare time. When Matthew isn't stargazing, he is an avid outdoor adventurer and reader - striving to make science accessible and engaging, publishing magazine articles and organizing community outreach events as Vice President of his university's Astronomy Club. "Equipped with his five senses, man explores the universe around him and calls the adventure Science." - E.Hubble

Tennessee Technological University
Cookeville, Tennessee
Electrical Engineering
Bachelors of Science with Mathematics Minor, May 2015
E-mail: smnolen42@students.tntech.edu

NASA Academy Research Project:

"Flight Control Systems Analysis for Space Launch Systems"
Principal Investigator: Don Krupp

Research and Experience

- **Teacher's Assistant,** Tennessee Technological University, Cookeville, Tennessee (Fall 2013-Current)
  - ECE 3300 Electronics I, HON 1010 Introduction to Honors
  - Graded tests and homework for Electronics in a timely manner with adequate feedback to students.
  - Assisted in Introduction to Honors to develop a method of teaching for the curriculum as well as collected and graded homework.
- **Undergraduate Researcher,** Mini Robotics Research Experience for Undergraduates, College Park, Maryland (Summer 2013)
  - Integrated flexible solar cells into flapping wing MAV and designed battery charger that harnessed the power from the cells to charge a lithium ion battery.

Honors and Activities

- Who's Who Among Students in American Universities and Colleges, 2014
- Rising Renaissance Engineer Spectrum Award, 2013,2014
- Captain Anderson Electrical Engineering Scholarship, 2013
- Tennessee Technological University Eta Kappa Nu Scholarship, 2013
- International Summer School for Young Physicists at Perimeter Institute, Canada, 2011
- Governor's School for Computational Physics at Austin Peay University, 2010
- Autonomous Robotics Club, 2011-present, President 2013-present, Vice President 2012-2013
- Eta Kappa Nu Electrical Engineering Honor Society, 2012-present, Treasurer 2012-present
- IEEE, 2012-present, President 2014-present, Southeastern Conference Chair 2013-2014
- Engineering Joint Council, 2013-present
- Society of Women Engineers, 2012-present
- Honors Council, 2012-present

Skills

- Matlab
- C++
- LabVIEW
- LT Spice IV
- Exposure to Fortran90
- Microsoft Word, PowerPoint, and Excel

Personal Statement

I am finishing my Junior year at Tennessee Technological University in Electrical Engineering. I have been involved in biomedical research emphasizing on wireless EKG machines, robotics research emphasizing on solar power integration for a mini-air vehicle, and an intern for a robotics team competition for a basketball playing robot. This is my first experience with NASA and I couldn't be more excited to start working.

My first in depth learning experience of space was at Perimeter Institute in Waterloo, Canada where I learned a small part of a PhD student's work in black hole physics. From then on, I knew I wanted to be involved with NASA's work in some way. After this sixteen day experience, I started my freshman year at Tennessee Technological University as a Physics and Electrical Engineering double major. While the physics major did not stay a part of my curriculum, the love of what it can represent permeated through my Electrical Engineering career in not only an electromagnetics but a controls focus as well.

Through another summer experience, Research Experience for Undergraduates: Miniature Robotics at the University of Maryland, I found a new passion. Solar cells have always been interesting, but that summer I was able to harness their power and integrate them into the wings of Robo Raven III to charge the on board batteries. As I enter my senior year of college, I look back at my experiences and am extremely thankful. They have helped me learn new things within my field and have introduced me to new topics. I look forward to this summer in the academy to do exactly that and more.

Wellesley College
Wellesley, Massachusetts
Astrophysics, Women's and Gender Studies
Bachelors of Arts, May 2014
E-mail: lperez3@wellesley.edu

NASA Academy Research Project:

"Analysis of Emission Morphology of Aurorae on Ganymede"
Principal Investigator: Melissa McGrath

Research and Experience

- **Researcher,** Physics Department at Wellesley College, Wellesley, Massachusetts, (Spring 2014)
  - Construction of directional dark matter detector; calibration of detector and electronic equipment
  - Simulated and analyzed WIMP tracks in Python
- **Research assistant,** American Museum of Natural History, Department of Astrophysics, New York, NY (Summer 2013)
  - Performed photometry and statistical analysis on the cluster M15 in search of symbiotic binaries and cataclysmic variables, using Python and DAOPHOT packages
  - Scoured the cluster and located undocumented cataclysmic variables and dwarf novae
- **Research assistant,** Keck Northeast Astronomy Consorrtium, Middlebury College Physics Department, Middlebury, Vermont (Summer 2012)
  - Processed, analyzed, and presented astronomy data on supernova remnants using IRAF, SAO ds9, and Adobe InDesign

Honors and Activities

- Wellesley College Academic Excellence Achievement Award (>3.5 GPA) 4 years
- Active member in Wellesley College Multifaith Council, Residential Life, First Year Dean's Office, and Whitin Observatory

Skills

- Proficient in Adobe InDesign and Photoshop
- Fluent in Spanish; seven years of formal instruction in French

Hobbies and Interests

Oil painting, interfaith communication and work, and observational astronomy. Musicals and theatre (In the Heights, The Phantom of the Opera, Shakespeare), reading (J.K. Rowling, John Green, Jodi Picoult, Peter Cameron, Elizabeth Bishop), art of all sorts (Van Gogh, Hilda Klinst, Adelina Anthony, Hector Berlioz), and breakfast foods (coffee, bacon, eggs, blueberries).

Personal Statement

Lucia is a Venezuelan New Yorker who just graduated from Wellesley College in Boston. She majored in astrophysics and minored in Women's and Gender Studies. During her college career, she did research on supernova remnants (Middlebury College), cataclysmic binary star systems (American Museum of Natural History), and dark matter detection (Wellesley College). In her other academic pursuits, she considered Latin@ feminism and representation in the arts and media, painted oil portraits, and rounded out seven years of study in French and almost picked up fluent Italian in year. In her free time, Lucia gave her time to student leadership positions as a student on Multifaith Council, a Residential Advisor, and a First Year Mentor. She also worked at the Office of Religious and Spiritual Life creating publications, DJ'd for the radio station, and was a member of the Latina students' organization and astronomy club.

Lucia's love of science began at the tender age of eight, at the plane tarium show in the American Museum of Natural History. It was about black holes, and it completely terrified her. When she took astronomy her first year at Wellesley, her fear turned into fascination and she hasn't looked back since. Her academic success began in fifth grade when she was accepted into Prep for Prep, an organization in New York that selects and prepares promising students of color for academic success and leadership in leading private school. From there, she attended the Nightingale-Bamford School, where she played lacrosse and helped create the yearbook. When she grows up, she wants to take over for Neil deGrasse Tyson. Meaning, she likes the idea of directing the Hayden Planetarium in New York City, doing her own astrophysics research, and promoting science through radio and media appearances. Lucia also wouldn't mind hosting the season of COSMOS that will be reincarnated once more astrophysical mysteries are solved. Although she loves New York City, she likes to travel and has spent time in many places, from a farm in Vermont to a huge university in London. One of her dreams is to take a trip across the Southern Hemisphere to visit modern observatories and archeoastronomical sites to learn about how people of all cultures and ages have developed relationships with the universe.

Program Director

Dr. Frank Six

Frank Six is the University Affairs Officer at MSFC. He joined Marshall in 1986 as Deputy Project Scientist for Hubble, then became assistant to the Director of the Space Science Laboratory and then deputy to the Chief Scientist. He directed the Marshall Academies in 1994, 1995 and 1996, and led all university programs from 1989 to 1996. Before coming to MSFC, Frank worked for Cornell University as assistant to the director of the Arecibo Observatory. Prior to that, he taught physics and astronomy at Western Kentucky University where he was Chairman of the Department for 17 years. Upon receiving the PhD in physics from the University of Florida, Frank joined Brown Engineering in Huntsville, Alabama working on the Apollo project. His research areas are radio astronomy and planetary magnetospheres. He is married with six children and eight grandchildren and loves to explore the coastal regions of the Gulf of Mexico.

Program Manager

Dr. Gerald R. Karr

Karr is a Professor of Mechanical and Aerospace Engineering at the University of Alabama in Huntsville. Since 1992, Dr. Karr has also served as the UAH Campus Director of the Alabama Space Grant Consortium (ASGC). Karr also served as the Chair of the Mechanical and Aerospace Engineering Department at UAH from 1986 through 1999. Since 1978, Karr has been the University Director of the highly successful NASA Summer Faculty Research Opportunity program. He has also been an active researcher in the areas of satellite drag, high-energy lasers, cryogenics, spacecraft thermal design and computational fluid mechanics. Karr earned his BS (1964), MS (1966), and PhD (1969) in Aeronautical and Astronautical Engineering at the University of Illinois at Champaign-Urbana. For recreation, Karr enjoys golf, running, sailing and visiting with his children and grandchildren.

Operations Manager

Andrew Dahir
andrewdahir@gmail.com

Andrew is an alumnus of the 2012 NASA Academy at MSFC. He graduated Cum Laude with high honors in May 2013 from with a Bachelor of Science Math and Physics with a Minor in Astronomy. Andrew worked in the X-ray Optics branch at MSFC during the 2012 NASA Academy and 2013 NASA Internship. Andrew is currently conducting his Ph.D. research at the University of Colorado-Boulder in Aerospace Engineering Sciences. His research involves using X-rays from Pulsars for autonomous navigation. His research in the NASA Academy and NASA internship included metrology of X-ray optics and calibration of a long trace multi-beam profilometer. Andrew enjoys rock climbing, snowboarding, camping, disc golfing, card games, ultimate Frisbee, listening to music, exploring, and spending time with his fiancé, friends and family. He also holds two Guinness World Records in team rock climbing.

- ***NASA Academy:***
  http://www.nasa-academy.nasa.gov/
- ***NASA Academy Marshall Space Flight Center:***
  http://academy.msfc.nasa.gov/
- ***NASA Academy Alumni Association:***
  http://www.nasa-academy.org/
- ***NASA Agency:***
  http://www.nasa.gov
- ***NASA Marshall Space Flight Center:***
  http://www.msfc.nasa.gov/
- ***International Space University:***
  http://www.isunet.edu
- ***The Soffen Memorial Fund:***
  http://www.nasa-academy.org/soffen/donors.html